AMMONIA
CAS # 7664-41-7

This fact sheet answers the most frequently asked health questions (FAQs) about ammonia. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Ammonia occurs naturally in the environment. Ammonia is irritating to the skin, eyes, nose, throat, and lungs. Exposure to high concentrations can cause serious burns and high blood pressure, and can stop the heart from beating. Ammonia has been found at 23 of the 1,177 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is ammonia?

(Pronounced ə-mōn′yə)

Ammonia is a colorless gas with a very sharp odor. It dissolves easily in water and evaporates quickly. It is commonly sold in liquid forms (dissolved in water or in pressurized tanks).

The largest amount of ammonia is produced naturally in soil by bacteria, decaying plants and animals, and animal wastes. Ammonia is a key intermediate in the nitrogen cycle and is essential for many biological processes.

The amount of ammonia produced in chemical factories is small compared to the amount produced naturally in the environment each year. About 80% of the ammonia that is made in factories is used to make fertilizers. The remaining 20% is used in textiles, plastics, explosives, pulp and paper production, food and beverages, household cleaning products, refrigerants, and other products.

What happens to ammonia when it enters the environment?

- Because ammonia is produced in nature, it is found throughout the environment in soil, air, and water.
- Most of the ammonia in water changes to ammonium, which is an odorless liquid.
- Ammonia and ammonium can change back and forth in water.
- Ammonia is recycled naturally in the environment as part of the nitrogen cycle.
- Some ammonia in water or soil is changed to nitrate and nitrite by bacteria.
- Plants and bacteria rapidly take up ammonia from the soil.
- Ammonia released to air is rapidly removed by rain or snow or reactions with other chemicals.
- Ammonia does not build up in the food chain but serves as a nutrient source for plants and bacteria.

How might I be exposed to ammonia?

- Everyone is regularly exposed to low levels in air, food, soil, and water.
- If you use ammonia cleaning products in your home, you will be exposed to ammonia released to the air and through contact with your skin.
- If you apply ammonia fertilizers or live near farms where these fertilizers have been applied, you can breathe ammonia released to the air.
- You may be exposed to ammonia from leaks and spills from production plants, storage facilities, pipelines, tank trucks, and rail cars.

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

How can ammonia affect my health?

Exposure to high concentrations of ammonia in the air may cause severe burns on your skin, eyes, throat, and lungs. It can also cause high blood pressure. In extreme cases, blindness, lung damage, heart attack, or death could occur. Breathing lower concentrations will cause coughing and nose and throat irritation.

If you swallowed ammonia, you could get burns in your mouth, throat, and stomach. Concentrated ammonia spilled on the skin will cause burns. Animal studies show effects similar to those observed in people, including irritation to the nose and lungs, lung damage, increased heart rate, and high blood pressure. We do not know if ammonia causes reproductive effects or birth defects.

How likely is ammonia to cause cancer?

Scientists do not know whether ammonia can cause cancer in humans or laboratory animals. The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have not classified ammonia for carcinogenicity.

Is there a medical test to show whether I've been exposed to ammonia?

There are tests that can detect ammonia in blood and urine. However, these tests cannot definitely determine if you have been exposed because ammonia is normally found in the body.

If you were exposed to harmful amounts of ammonia you would notice it immediately because of the strong, unpleasant smell and strong taste. Your skin, eyes, nose, and throat would also be irritated.

Has the federal government made recommendations to protect human health?

The EPA has determined that the level of ammonia in lakes and streams that might cause health effects from drinking water or eating fish contaminated with ammonia depends on the pH and temperature of the water. Therefore, it is not possible to establish a safe limit that applies to all bodies of water. Any release to the environment greater than 100 pounds of ammonia or 1,000 to 5,000 pounds of ammonium salts must be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set a limit of 50 parts per million (50 ppm) over an 8-hour workday, 40-hour workweek.

The National Institute of Occupational Safety and Health (NIOSH) recommends that workplace air should not exceed 25 ppm ammonia averaged over an 10-hour workday or 40-hour workweek. A short-term exposure limit (up to 15 minutes) of 35 ppm is recommended.

The federal recommendations have been updated as of July 1999.

Glossary

Carcinogenicity: Ability to cause cancer.

Evaporate: To change into a vapor or a gas.

National Priorities List: A list of the nation's worst hazardous waste sites.

ppm: Parts per million.

Source of Information

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. Toxicological profile for ammonia. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Animal testing is sometimes necessary to find out how toxic substances might harm people and how to treat people who have been exposed. Laws today protect the welfare of research animals and scientists must follow strict guidelines.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-639-6359. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.